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tation; if I have occasionally touched on it in the course of the preceding observations, it was only to elucidate some passing question, or to confirm some uncertain identity. Archaic researches would, moreover, detract from my present object, which is to exhibit Epirus under its natural aspect with reference to physical resources and industrial capabilities. That aspect, it is true, has undergone some changes, and was in former ages modified by human industry, and by a civilisation of the elder times. But those early works of man were sacrificed to the terrible vengeance of an exasperated master. Epirus has never recovered from the desolating chastisement inflicted upon it by Æmilius Paullus, 167 years B.C.; and at this day the country, with its fine climate, its varied resources and commanding position, is appealing to man to recommence the work of scientific industry and progressive improvement.

I shall conclude by observing that Epirus is inhabited by a heterogeneous population of about 350,000 souls, of whom the greater part live by husbandry of a primitive fashion, and are dispersed in villages and hamlets to the number collectively of 1600 and more. For the non-agricultural part of the population there are Janina, the capital, and some 15 or 20 small towns of moderate pretensions.

Janina, January 19, 1869.

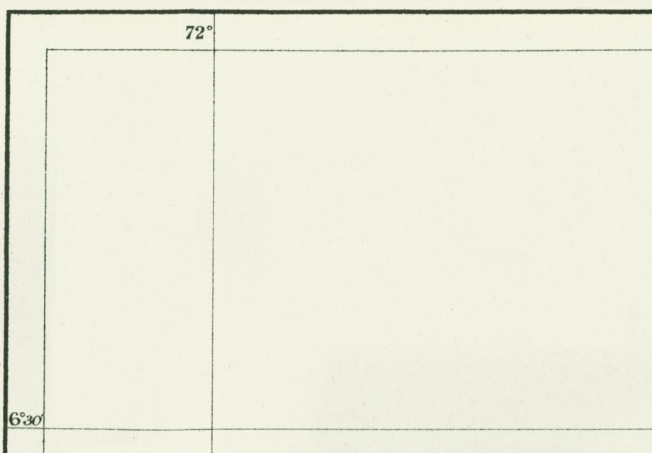
XIII.—*Notes of a Journey up the River Juruá.*

By W. CHANDLESS, Gold Medallist, R.G.S.

THE journey, unsuccessful in its main object, of which the following notes are offered, was made during the last five months of 1867.

Though furnished with recommendations from the Government at Manáos to the local authorities of Teffé, which was my starting point, I had the greatest difficulty in obtaining a crew even for one canoe; in fact, as one of the men I counted on failed me at the last moment, I could not have started but for the kindness of S' João da Cunha Correia (himself an explorer of the Juruá), who to complete my crew sent with me a slave of his—a man very useful on the lower part of the river, as he knew that, and the Indians on it, but in the crisis of the journey as bad a man as I could have had with me. Mine was Hobson's choice, or I would not have taken a slave.

The river Juruá is at least one-third smaller than the Purús, but in other respects so similar that a very short description of its general character will suffice. Its water is "white," or



Map of RIVER J

For an estimated distance of 980 Geog.

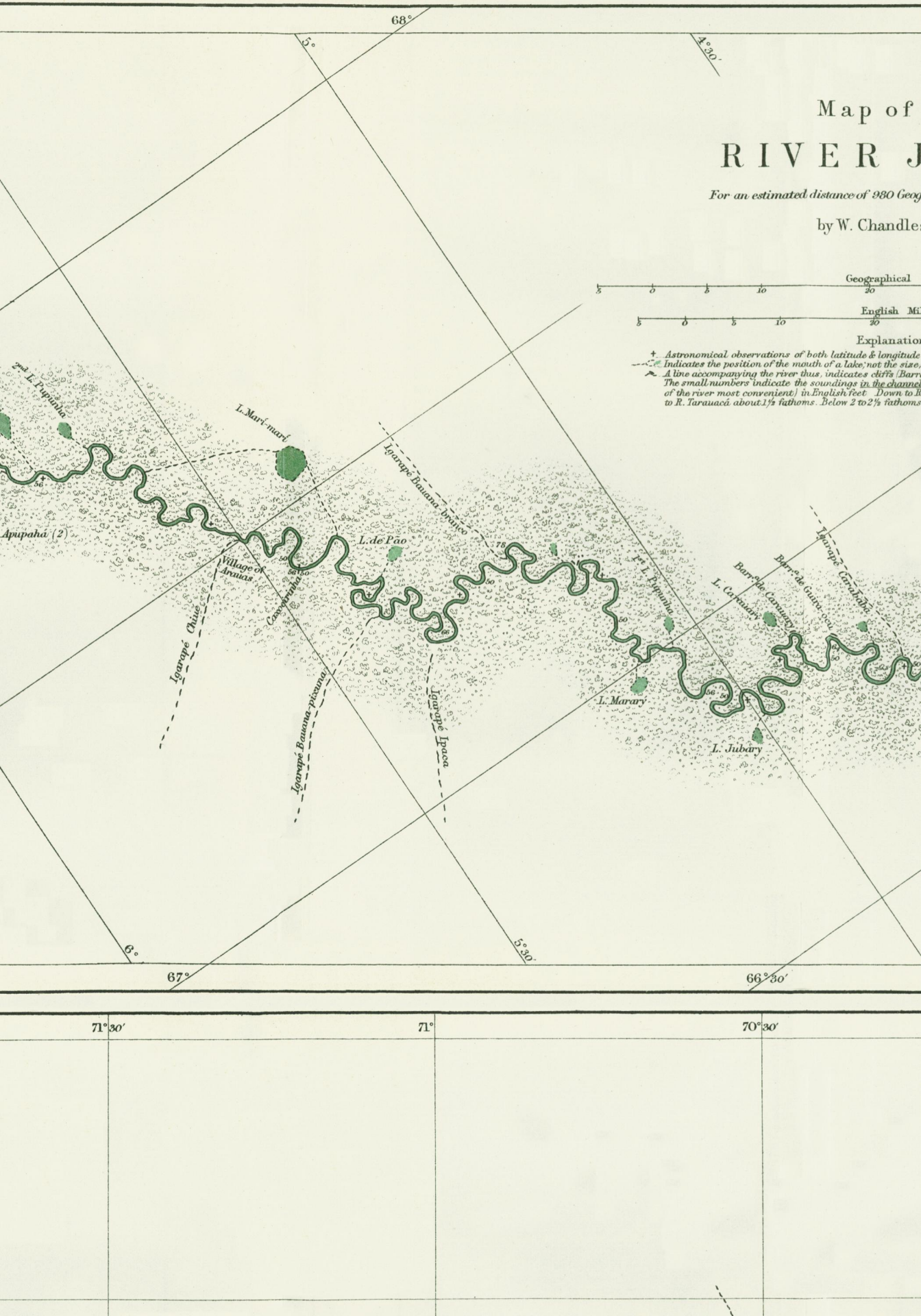
by W. Chandler.

Geographical
5 0 5 10 20

English Mi.
5 0 5 10 20

Explanation

- + Astronomical observations of both latitude & longitude
- - - Indicates the position of the mouth of a lake, not the size.
- ~ A line accompanying the river thus, indicates cliffs (Barre).
- The small numbers indicate the soundings in the channel of the river most convenient in English feet. Down to 1 to R. Tarauacá about 1½ fathoms. Below 2 to 2½ fathoms.



67° 30'

67°

Map of the R J U R U Á

Distance of 980 Geographical Miles from its mouth

W. Chandless, Esq^{re}

Geographical Miles

30 40 50

English Miles

30 40 50

Explanations.

Latitude & longitude (Chronometrical) taken at nearly the points so marked.

Lake, not the size, form, or position of the lake.

Indicates cliffs (Barreiras) or high land on that side.

Shades in the channel, but are marked without reference to that, on the side

in feet. Down to St. Gregorio the Jurua had less than a fathom, thence

from 2 to 2½ fathoms.

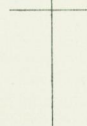


70°

69° 30'

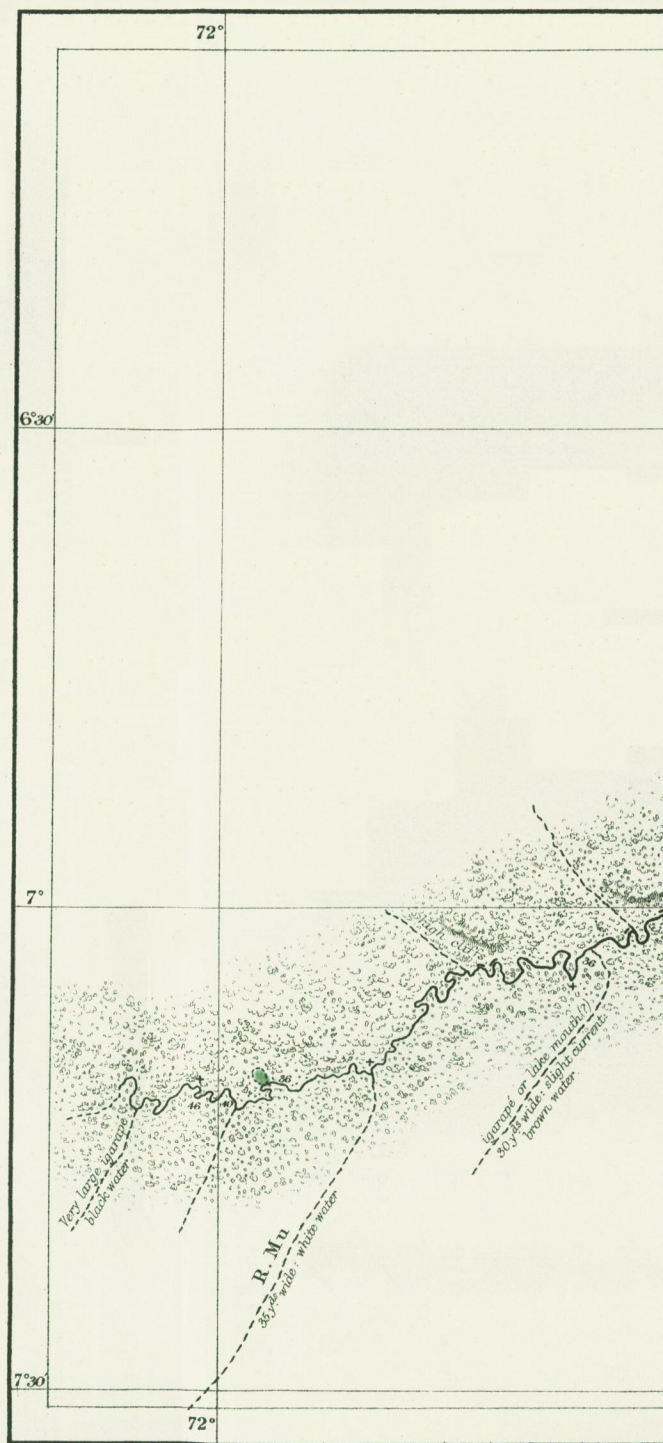
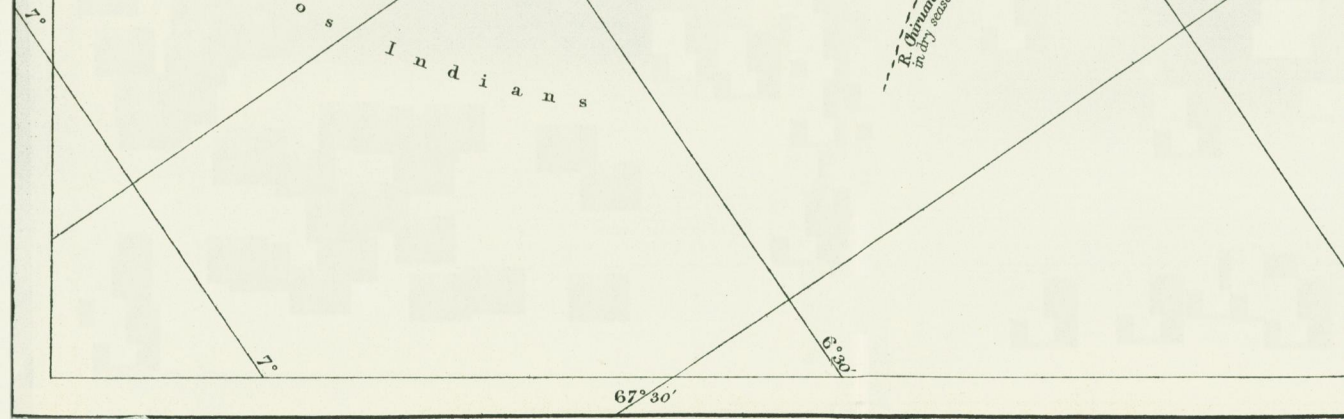
68°

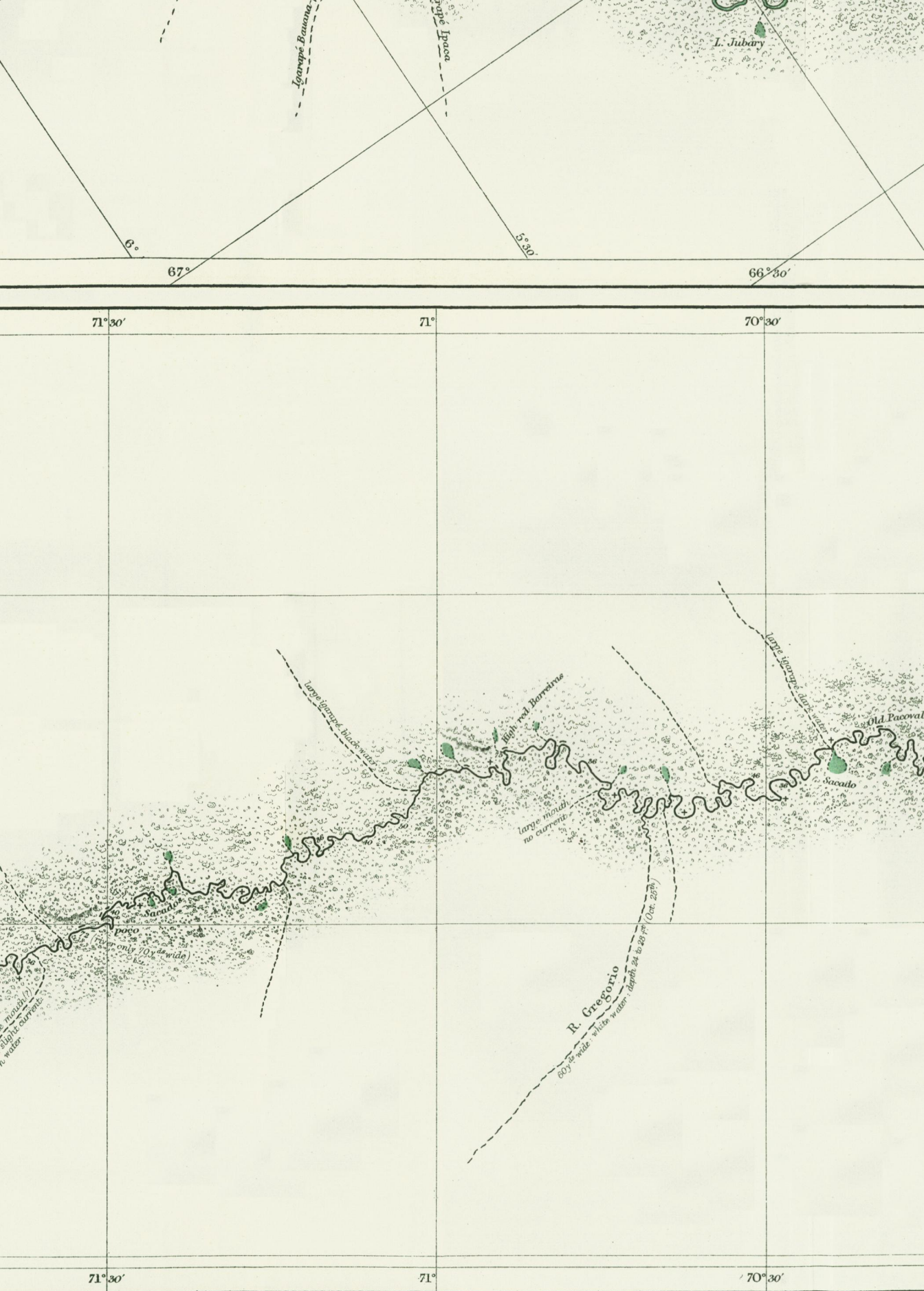
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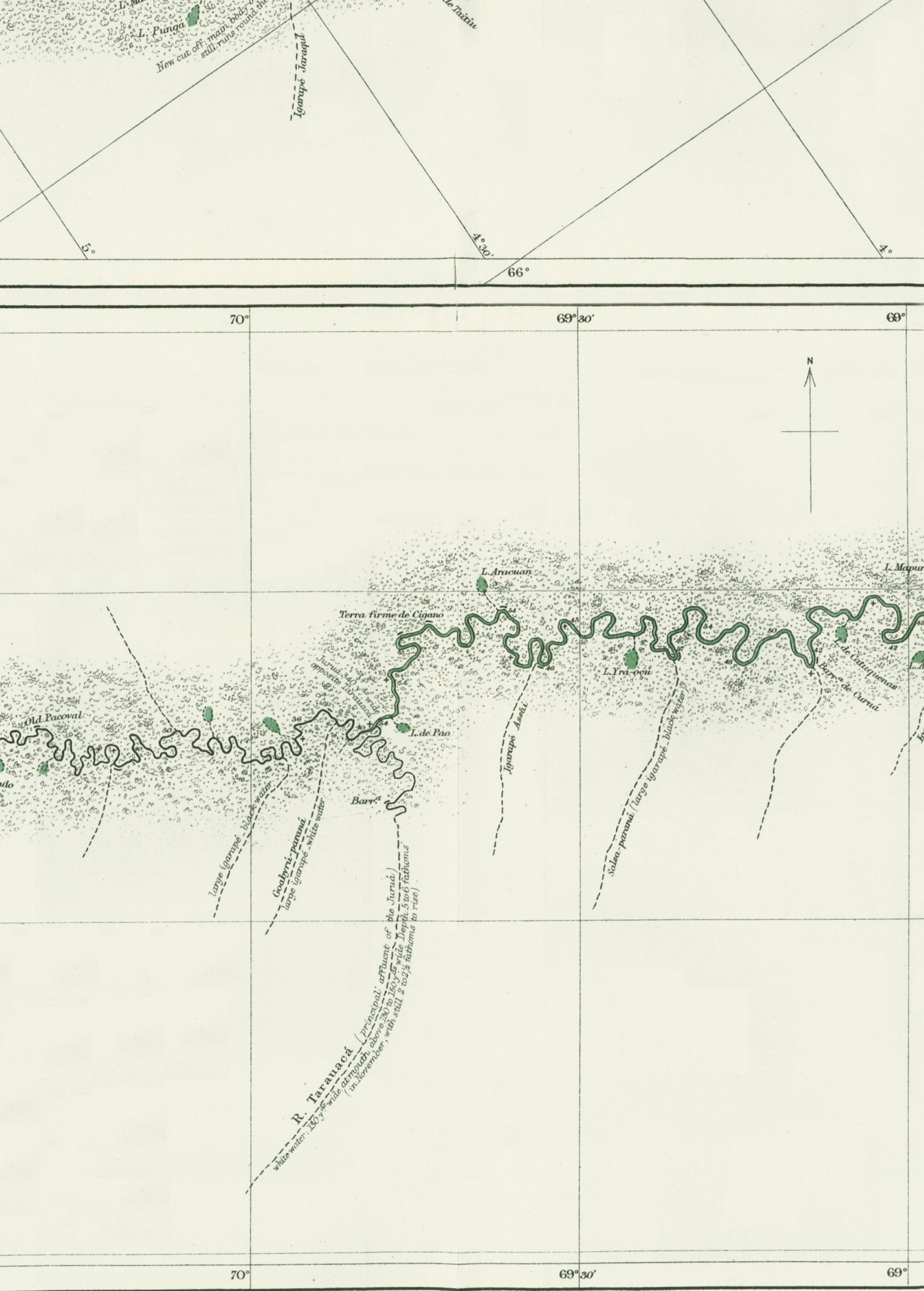


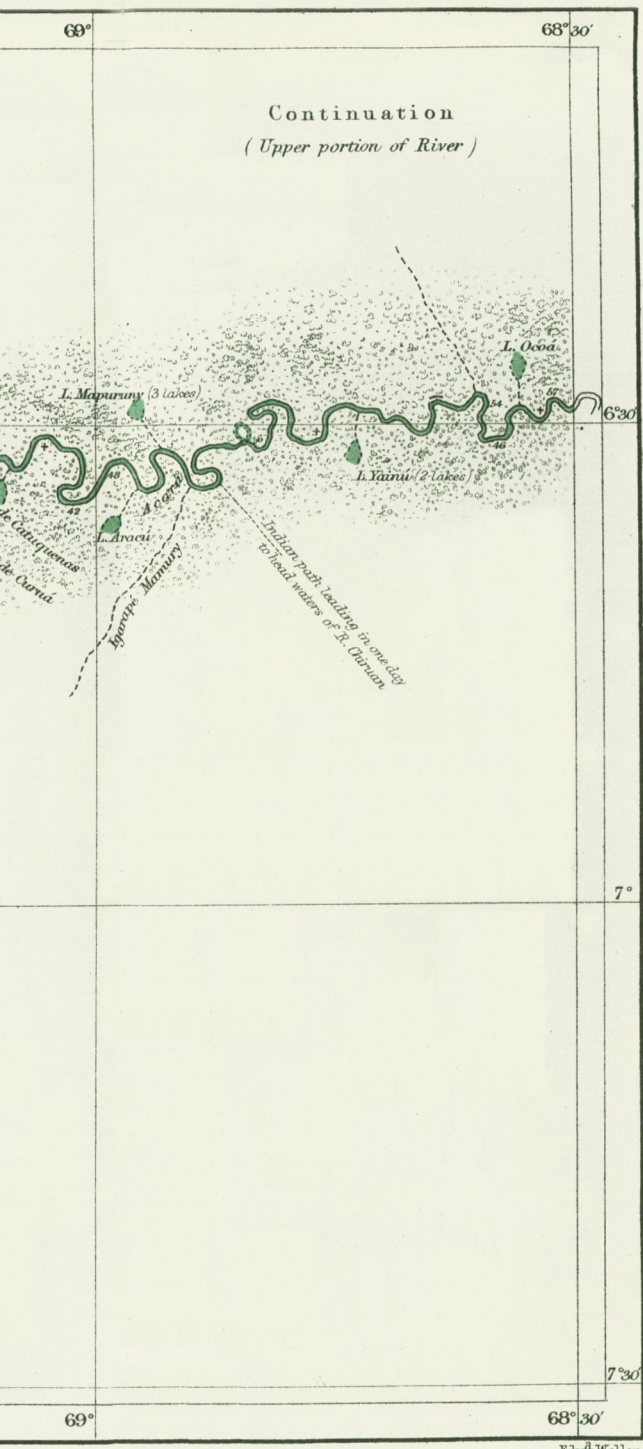
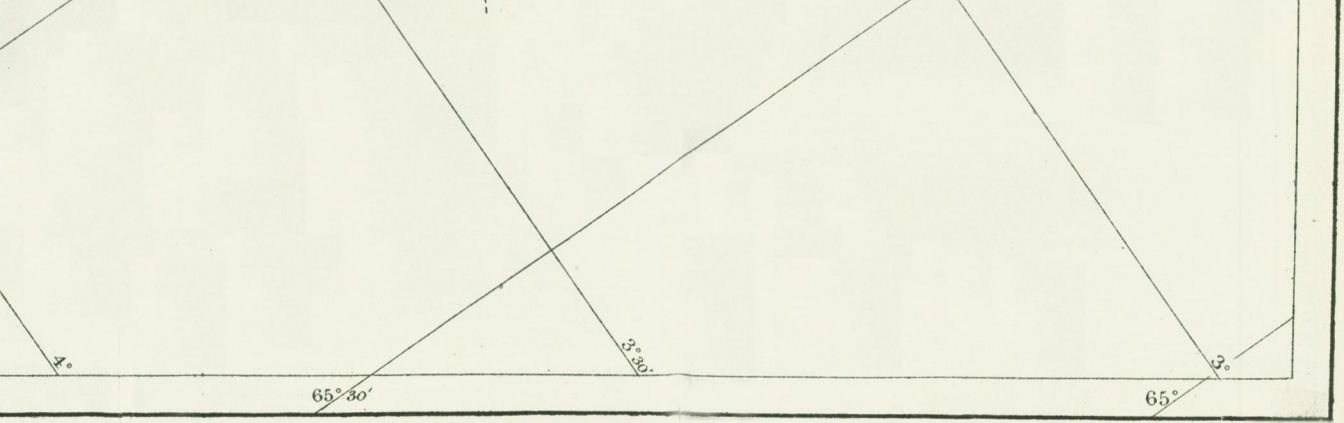
L. Aracuan

L. Maguary









muddy; it is very tortuous, and consequently has cut off many bends, and thus made many lakes, or rather backwaters. On the convex side of the bends the land is generally "igapó," fringed by sand-banks, left dry in the dry season; on the concave side it is alluvial plain (varzea), with here and there "terra firme," abutting on the river with cliffs (barreiras). Both the "terra firme" and "varzea" are, as a rule, lower relatively to the water-level than on the Purús; in other respects alike.

Cocoa (cacao), copaiba oil, and sarsaparilla, are the chief natural products sought, and seem abundant; within the last few years, however, india-rubber also has been procured. So far as I have seen, the india-rubber trees are more scattered than on the Purús. The Brazil-nut-tree, elsewhere generally abundant on "terra firme," is exceedingly rare on the Juruá. Above the mouth of the River Tarauacá the tocun-palm (the fibres of which, both unmanufactured and in cord, are the chief export of the River Japurá) is very common.

The only impediment to navigation that I am aware of is a shallow, wrongly called Urubu-cachoeira (as it is not a rapid), which is somewhat troubled with snags; but—as far as I could examine—with but little rock, and that only near the left bank. I am told that in very dry seasons it is difficult of passage even for small canoes; but on my return at the end of November, with continuous soundings, I found in the middle of the river nowhere less than $6\frac{3}{4}$ fathoms and the river had still at least $1\frac{1}{2}$ fathom to rise. Therefore, for much the greater part of the year, it would not be an impediment even to a steamer. There is also, lower down, a place called Cachoeirinha; but this is simply a ledge of rock near the left bank, and the channel on the right has more than average depth. In general the Juruá is much more free from snags than the Purús, and from the farthest point reached—1100 miles or so from the mouth—we always floated down at night without keeping watch; a precaution I did not venture to neglect on the Purús, though a larger river, till within 600 miles of its mouth, and the first night I did so we struck on a snag.

In the dry season, the water of the Juruá, at least the surface water, attains a very high temperature, perhaps from being heated in passing along the edge of the sandbanks. On one occasion I found it above 88° Fahr., and often 87° . On fine bright days in August and September there was usually a difference of 2 or 3 degrees between the temperature at sunrise and that at 2 to 3 P.M. The water, of course, was tested more or less in mid-river; generally when we were crossing from one side to the other.

In the sense in which commonly a river is said to have islands, the Jurúa has none; the tracts cut off by the Mineroá, Bereo, and other channels, are too large in proportion to the size of the river to be considered such. In the valley of the Amazons, if the application of the term *island* were not limited, it would be hard to say when one is not on an island. These channels are noticeable for the large size of their mouths, or lower entrances, but little inferior to the main river; but in their upper part they are small, and can scarcely in full flood bring down more than one-eighth, or perhaps one-tenth, of the river water, and in the dry season none at all. On my return I came down both these channels.

The Mineroá channel can be passed at all seasons by small canoes, but in one or two places with difficulty. From its upper entrance to the Resaca Grande it is scarcely over 60 yards wide, but with (in December) a strong current, and 5 fathoms depth. Below that it has less current, but is wider; it is however in few places over 150 yards, till its last three or four miles, where it widens greatly. From where it assumes an easterly course the country between it and the Amazons is one of those labyrinths of lakes and channels which, however often I may see them, never fail to impress me with wonder. *I am told* that in the dry season the water from the Resaca Grande often runs out by the upper entrance,* and that then there is no current *down* till below the mouth of Lake Mineroá, and below that black water. The tendency of side channels of this kind running *from* a main river to accompany that *up* stream, with a course as if of an affluent running to it, and sometimes for several miles, though not uncommon, is remarkable.

The Bereo is somewhat larger than the Mineroá channel, but has less current; and in the lower half, where it widens out to 200 yards or more, it had (in December) scarcely a perceptible one. In August its upper entrance was completely barred by a sandbank, and I walked across it dry-shod. Its course is tortuous and capricious, but the *very* near approach to the main river (about half-way) must be received with some reserve, as depending for some distance on dead reckoning. On this channel, a little below the mouth of the Igarapé de Bereo, is a village of Marauá Indians. They have another on the Tucumá

* The same occurs on a larger scale (as I have been told on the spot and by many persons) in the Canumá or Urariá channel, as it was formerly called, between the Rivers Madeira and the Amazons. For about eleven months of the year the water runs from the Madeira, and when that river is rising with an almost furious current; but usually for about three weeks in the month of October, when the rivers are at their lowest, the reverse is the case, and the river Canumá then bifurcates; a part of its black water running westwards to the River Madeira, and the remainder eastwards to the Amazons.

channel, and also on the Mineroá channel, and there is one family of them near the main river on the Igarapé Caá-piranga. In all, those on the Juruá can hardly amount, I think, to 80 souls. At this village, including children, there were 28 but five were from below. These Indians, though they still hold together, may be considered now a part of the ordinary population of the Amazons; they all understand and can speak the *lingoa geral*, and are I believe all baptized; moreover, they have a considerable admixture of non-Indian blood.

The Tucumá channel was not passable in December, and is so only in full flood; the Arapary channel is, I am told, still smaller; and neither of them deserves any more detailed notice.

On the large Igarapé Jaraquí is a village of Catauixis, the only one of this tribe on the Juruá, with about 20 men; including in this number lads above fifteen. They are said to be the remnant of a much larger population. The number of Indian tribes represented on the Juruá, and the small number of the representatives is notable. These Catauixis, like those of the Purús, are industrious and skilled in the making of pottery; but they have had much more intercourse with traders, &c., and have now but few distinctive characters. They were now all up-river, working at india-rubber for a trader.

As both the water-side Indians and the traders who travel up the river are comparatively few, the Juruá is extraordinarily abundant in fish and game. Mosquitoes are not much felt till above lat. $6^{\circ} 30'$ s., and then only in certain parts. Pium-flies* also are somewhat less numerous than on the Purús, but Maruim-flies† infinitely more so; for the first time I realised, as not improbable, Humboldt's estimate of 1,000,000 to the cubic foot of air.

Above the Catauixis there are no Indians till lat. $5^{\circ} 30'$ s., where on the igarapé Chiué, is a single village of Arauas. I found them camped on a sand-bank hard by. Herndon mentions them as treacherous; and in fact they have killed one or two persons somewhat treacherously, but perhaps not without provocation. They have long had dealings with traders, and seem not a warlike, but a timid race. In language they are akin to the Purû-Purús (Pammarýs). A good many of them now speak the "lingoa geral," and all I saw were regularly clothed, like ordinary Amazons-folk. I was much pleased with their courtesy and friendliness. Though curious to see things, they did not beg. Two of them agreed to accompany me, and of course I paid them in advance. Their companionship lasted

* "Pium: musca Simulium, interdiu infestans." 'Gloss. Ling. Bras.,' p. 470.

† "Maruim: insectum musca, sole occidente grassans." Ibid. p. 462.

5 days only, up to the River Chiruan. Beyond this they were evidently unwilling to go; therefore, seeing that they purposed to steal away at night, I told them they were free to go by day. They seemed grateful, and voluntarily brought back to me such of their pay as they had with them, offering even the clothes they had on. Their chief reason was fear of the Indians above (Culinos); but they seemed little accustomed to hard work, such as rowing all day, for Indian journeys are very short. Moreover, they fared badly; for one of them had a pregnant wife at home, and the other an infant child: and under these circumstances they will eat but of certain food; not of any skin-fish, nor of all scale-fish; *e.g.*, not of tambaqui, nor piranhas: one would not eat of the male turtle, and the other neither of the female nor of the eggs; nor would they eat ducks, nor wild pigs, nor tapirs. In fact, they would eat of nothing easily attainable, except curassow-birds; and even on the Juruá it is hard to ensure an unfailing supply of these. I understood the motive of this quasi-fast to be religious, not physical; but they were averse to being questioned on the subject, and my delicacy prevailed over my curiosity.

The Chiruan is the first affluent of the Juruá that is entitled a river, those below being only igarapés. It is but some 35 yards wide, but had $1\frac{3}{4}$ fathom depth even in the heart of the dry season, and runs out with a fair current; its water was then a yellowish brown, but in the season of flood is black. Many black-water streams have this change in the colour of their water, according to the time of year. It is said to come from some distance, running not far from the main river, but it nearly approaches the river Tapauá (affluent of the Purús), or some affluent of that river.

Above the River Chiruan on the right side of the Juruá is the country of the Culinos,—a numerous tribe of the interior, who are said not to have canoes, but to come by land to the sand-banks at the time the turtles lay. They are considered treacherous and hostile if in sufficient numbers; consequently it is a rule of travel always to sleep on sand-banks on the left side of the river, in this part,—a necessity which sometimes induced us to stop earlier, sometimes to travel later than I would have wished. We saw nothing of them; and, from other Indians above, heard that they had not been seen on the sand-banks for the last 2 or 3 years. They are met with also on the River Tarauacá, and probably extend a considerable distance s.w.

For ten days' journey above the mouth of the River Chiruan there are no waterside Indians on either bank of the river (Juruá); the first village being one of Conibos, by the small Igarapé Acará, their only village on the Juruá. These Conibos

are the same tribe of Indians that on the Purûs I have spoken of by the name of Manetenerýs, and which the Brazilian explorer Serafim erroneously called Cucamas, though they have not a word in common with the latter. Whether they are true Conibos or not, I cannot say;* but they call themselves, and other Indians call them, such. They may have been originally a colony from the Purûs, or those of the Purûs may have passed to that river from the Juruá, and these remained behind. As to this I could ascertain nothing, except that they are not new comers, but have at different times occupied various sites above and below their present one. Now they are a sort of trading-post for the rest of their tribe. They work more or less for traders, and sell their superfluous iron implements to their brethren of the Purûs, from whom they buy the long ponchos of cotton-cloth, which the latter weave and wear, and which these wear but do not weave. Almost every year they send an expedition to the Purûs, or rather to a village three days' journey inland from that river, as they told me. A number of them whom on my return I met with here, were now absent on such an expedition. They all knew of my journey up the Purûs—perhaps I made a bad market for them that year—and informed me that my servant was killed by people of their tribe, as I had originally believed, and indeed written in my paper on the Purûs, and not by Hypurinás. I was glad at least to find the latter, a fine warlike race, freed from this stain of treachery, which ill-suited their character. Reports that come through Indians, I may observe, merit little reliance; and not a whit more for being very circumstantial. A catastrophe that never happened is told in minute detail.

These Conibos are just as tiresome and importunate beggars as the "Manetenerýs," and a singular contrast in manners to all the other Indians of the Juruá; particularly to some who chanced that same afternoon to come to the sandbank at the mouth of the Acará. These were from a village a few miles above; part of them Canamarýs, and part of a tribe known as Fish-Indians. The latter belong to the river Cuniuá, an affluent of the Tapauá (itself an affluent of the Purûs), and had come to the Juruá only four months before. I got one of them to mark on the sand their route—down the Cuniuá to the Tapauá; up this—overland to the river Chiruan—and so out on to the Juruá. Their language seems akin to the Araua and Purû-purû; but, for lack of an interpreter, I could inquire nothing as to the cause of

* If so, the acquaintance of the Manetenerýs with the Ucayali and Sarayacu is at once explained. A comparison of the languages would decide the question.

their migration. But for my catching the name Cuniuá, I should not have found out even thus much; as the Conibos knew only that they were new comers, but neither understood their language nor seemed to feel the smallest curiosity respecting them. They brought us fruit, and a few trifles for sale, but did not come empty-handed to ask for anything. On the following morning they continued their journey downstream; why or whither I did not learn. Their dress was simply a "tanga"—by courtesy translated "apron." Most of them had necklaces of beads; the chief had a crescent of shell suspended from his nose. Besides bows, they had the "palheta" or stick for throwing arrows; but they use this only for striking fish and turtles.

These Canamarýs did not understand any of the words (a very few) which I had obtained from those on the Purús; nor do I find any of them in the Canamarý catalogue in the 'Glossaria Linguarum Brasiliensum,' but every one in that of the Culinos or Maxurunas. One word seems to me instructive: the common answer of the Canamarýs I met on the Purús, if asked for something they had not, was "Yamai," equivalent to the Spanish "No hay;" in the Culino catalogue ('Gloss. Ling. Bras.,' p. 243) I find "moriór = yamai." On the whole, I am inclined to think that on the Purús there are two tribes of Canamarýs; the one, which I did not meet, true Canamarýs, and those above, whom I met with, more probably a branch of the Culinos. The latter, however, called themselves, and the Manetenerýs (or Conibos) called them, Canamarýs.

I engaged two men of this Conibo village to work in my canoe, and found them good men for work; very different from the poor Arauas. They had no scruples about food, but a great avidity for salt; so that my stock of salt fish, which we had scarcely touched, and which my men had wished more than once to throw away, was to them the greatest of treats, and one of which they did not tire to the last. On my return these two men remained at their village; and two others asked me to give them a passage to Paranarý, the house of Sr. João da Cunha a little above Teffé. As I afterwards heard, they stayed with him but about ten days, and then stealing a canoe and sundry axes, guns, and other loose articles, went back to the Jurua.

A week's journey from this Conibo village we fell in with some Catuquenas, who chanced to be at their port: their village (maloca) was, they said, a day's journey inland. They are one of the most widely scattered tribes of the Amazons, but not often met with on the banks of white-water rivers, owing to

their aversion to the insect-plagues. The men seemed fine, tall, strong fellows; only apron-clad.

In a few days more we reached the mouth of the river Tarauacá, the chief affluent of the Juruá; and nearly two-thirds the size of that river above. From this it might be termed a confluent, but it enters strictly at right angles, and its general course for the distance I went up it—some 16 or 17 miles—makes rather an obtuse angle with the Juruá. Its mouth is 130 yards wide (as I found by triangulation), but within, the river is somewhat wider. I found 5 to 6 fathoms depth, which was about a fathom less than the average depth of the main river for some distance above, but the latter was in fuller flood. The water of both rivers is white, and I could see no difference in the colour, and found only 0.5° Fahr. in the temperature. One of M. Castelnau's informants (whose names seem now quite forgotten in Teffé) gives the water of the Tarauacá, and the other that of the Upper Juruá, as black: both erroneously. In general, reports on this point may be trusted, as it is a fact usually observed and remembered; indeed, black and white water rivers differ in their general aspect as much as a negro and an Indian. One of the two informants also states, that a *little* above the Tarauacá, the Juruá divides. I travelled, however, exactly a month up stream above, and met with no such bifurcation.

Before leaving the Tarauacá, it is necessary to say a few words as to the course of the Juruá. This from about the parallel of $6^{\circ} 30'$ s., to the Amazons, is not very different from that usually marked, though even in this part it makes more easting; but above that, for a considerable distance, it runs nearly from e. to w.; just as the Purûs does along the parallel of 9° , and its affluent, the Aquiri, along that of 11° , and as the river Javary (as we know from the recent exploration by the Frontier Commission) does nearly along that of its mouth. This easterly direction of the rivers must be considered a marked feature in the district between the Madeira and Ucayali; as though there were a series of parallel ridges, or steppes, between the upper Amazons and the base of the Caravayan Andes. On the Juruá, at any rate, this easterly course is evidently caused by a ridge, or rather, perhaps, the edge of a range of high land, but that cannot be called a range of hills, running about e. and w. on the left side of the river; generally inland, but against which this strikes from time to time and rebounds, till at last it rounds the end in a very noticeable bend. Indeed, throughout the whole distance I travelled, the *terra firme* is mainly on the left, and what there is on the right, is comparatively low; in connection with

which is the fact, that on the left the Juruá has not a single affluent, except small streams—igarapés and lake-mouths.

The above-mentioned bend is, as might be expected, the point where the Juruá most nearly approaches the Purús; the distance being, according to my maps, 104 geographical miles in a direction a little S. of S.E. from this bend to near the mouth of the Paunym on the Purús. This may be the approach that in old times was reported; and I should be very bold were I to say that Indians may not have passed from the one river to the other here. The Indians, however, now existing here are of tribes warlike, numerous and intractable: the Hypurinás near the Purús, the Culinos near the Juruá, and the Jamamadys* in the centre.

The approach, that in modern times has been spoken of, is one higher up, by way of the Tarauacá; and, in fact, can hardly be called an approach of the two main rivers at all. João da Cunha travelled up the Tarauacá and the Embira, an affluent of it on the right, 8 or 10 days' journey from the Juruá, he tells me, and thence overland to the bank of the main Purús; and this was formerly the regular route of the Conibos on their trading journeys: but, in consequence of frequent attacks from Nauas, wild Indians of the upper Juruá, they abandoned it, and now have a path from Lake Yra-ogu (Great Honey Lake), some distance below, which cuts across to the Embira.

It is an odd coincidence—for it can hardly be considered more—that on my maps the point of the Purús nearest to the mouth of the Tarauacá is almost exactly that at which the path from the Juruá strikes the former river, 130 geographical miles distant.

I have but little doubt that the small affluent of the Purús, which I marked with the name Tarauacá, is not entitled to that name; and that the Indians merely meant that it was a way of passing to the great affluent of the Juruá. A complete water-communication has indeed been reported to exist between the two rivers; but the Conibos told me they knew of none such.

About 5 miles above the mouth of the Tarauacá a very large igarapé Goabyru-paraná (Rat River) enters the Juruá on the same side. As its water is white, I should have thought it another mouth, but that the temperature was nearly 5° Fahr. lower. This is the last name of which I could obtain any report. None of the Conibos were acquainted with the upper Juruá; nor have drug-collectors, at any rate in recent times, been materially higher, chiefly from fear of the Nauas—a fear that soon began to show itself in several of my men. Twice the

* The Culinos and Jamamadys may possibly be the same tribe under different names: the latter at any rate, like the former, are said not to use canoes at all.

oars, or paddles, were thrown away at night, in the hope of thus stopping the journey, or perhaps causing a return. On the first occasion, however, all, and on the second two, of them drifted ashore at the lower end of the sandbank on which we had slept. After that, as I had no more spare oars to lose, I always at night collected all in use and put them in the stern, and slept on the top of them. Next a camp-kettle vanished; but I said I could live very well on roast, and the remaining one was spared. Fortunately it is not easy to injure a canoe of hard wood without making a noise. It would be unjust to imply that all the men were capable of such acts: three I am sure were not, and perhaps I wrong another; one only, however, was of good courage, and went with a good will. In his honour (*si qua est ea cura*) I called the next affluent River Gregorio.

This is a good-sized stream, more than 50 yards wide, and then (Oct. 25th) 4 to 5 fathoms deep, and flowing out bravely with water much like that of the Juruá. I was surprised to find its temperature 1·7° Fahr. higher than the latter, there only 80·0° then.

Up to this we had seen no signs of Indians, except one or two small plantations nearly choked with wood; but in a few days we came rather unexpectedly upon some on the river-bank. They turned out not to be the dreaded Nauas, but of what tribe they really were, what they were doing, and how and whence they came to the place we met them at, remained a matter of conjecture. There were 15 or 16 men on the bank-side, with women and children close inland; but it was not the "port" of an inland village and we saw but one paxiuba-canoe, which could not have carried above six or eight persons. They evidently had no fear of our attacking them, nor any intention of attacking us; for they sold very willingly their bows and arrows, and came on board my canoe in such numbers that we were regularly mobbed, owing to which it was impossible to inquire or learn much. They varied a good deal in appearance and permanent ornamentations; one or two, for instance, had pegs under the lower lip; one seemed to me a half-breed, having a beard and moustache, and neither Indian hair nor type of face. The only word I recognised was "wary" (sun), the same as in the Culino and Maxuruna languages; so perhaps they belong to one of these tribes. One thing they explained to us very clearly, viz., that in eight or ten days more up-stream we should meet the Nauas, who would fight us: a piece of information only too correct. On our return we saw nothing of these Indians.

I had the satisfaction of reaching one more affluent—like all the rest, on the right; a small river, to which I gave the name Mu, as I had hoped at its mouth to have observed an occultation of μ Piscium, but cloud prevented this.

At last, one evening, we reached a Naua plantation, the size of which showed they were somewhat numerous, and its cleanness that they had been recently there. The next morning we shortly passed two more plantations, and rounding a point reached the "maloca" of two large houses. The people were apparently all absent, but at this moment a canoe from above came in sight; we called to those in it, but they turned back up-stream. About three miles above we found them all on the river-bank. They had three very long but narrow canoes, and at once ran to these, beating their breasts with their hands, and their large round black shields (of tapir-hide, it is said) with their spears—for they had spears as well—and bows and arrows. Only two of the canoes put out, and one kept a good way behind the other, the foremost having but five or six men in it. From their gestures I can scarcely doubt that they came out to fight, but I doubt a good deal whether at first they knew that we were white people, and I hoped by showing beads, &c., to bring them to a parley. But when they were eighty or ninety yards off, and still making signs of war, my men, recollecting the disastrous attack of the previous year (1866) on the Brazilian-Peruvian expedition up the river Javará, would wait no longer, and despite my orders fired before an arrow had been shot at us. The first shot missed, and they still came on, but the second wounded one of the Indians in the arm, and then they stopped, and at a third shot retired. We followed, but as they were both up-stream and in-shore of us they gained the bank; here there were about thirty Indians, just under cover of the wood, but of these how many were women I cannot say. One arrow only was shot at us, and that fell short. We stayed about half an hour opposite them, and out of arrow-shot, to see what they would do. Perhaps they stayed where they were with a corresponding intention. They did nothing; we the same. But at the proposition of continuing our journey, there was a general outcry of all my men, with one exception, against doing so. No doubt it involved a certain amount of danger, as an up-stream canoe must stick close to the bank, and it would have been easy for the Indians to plant ambuscades, but from their bold daring I doubt whether they would have done so. To fight our way, or even resist continual skirmishing attacks, we were too few, being only eight in all, and the two Conibos and a Miranha could not be counted on in danger. But we should have gone and seen. Had we done so and been again attacked, I should have been content to turn back. As it is, I look back on the day with shame.

We floated down-stream till out of sight, that we might not seem to run away, and touched at the village (maloca), where

some Indians must have remained, as a fire was alight. We carried off a little pitch we found, for which I left ample payment in iron implements, hoping that this might make the Indians understand that our object was not to harm them.

The river at this the farthest point of my journey had an average width of 130 to 150 yards, and a depth of 5 to 6 or $6\frac{1}{2}$ fathoms; it had however here nearly reached the last flood-mark. It would be idle from the size of so considerable a stream to conjecture at what distance its source may be. But from the geography of the surrounding rivers some probable conclusions may be drawn. The Ucayali, below the mouth of the Camisea, as we learn from M. Castelnau, receives on the right no stream of any importance; obviously, therefore, from a very short distance to the east of it, the water falls into other rivers. The Purús and the Javary certainly rise not far from the Ucayali (as also perhaps may the Jutahy); the Javary very little s. of 7° lat., and the Purús, with its upper affluents, from lat. 10° , to 11° or $11\frac{1}{2}^{\circ}$. It seems to me therefore very probable that the Jurúa rises in about 9° , or $9\frac{1}{2}^{\circ}$ s. latitude, and, like the other rivers, near the right bank of the Ucayali.

POSITIONS ON THE RIVER JURÚA DETERMINED BY OBSERVATIONS.

	Lat. South.	Long. W. of Greenwich.	
		In Time.	In Space.
		H. M. S.	° ' "
Mouth of River Jurúa (right or lower point) ..	2 37 36	4 22 54	65 43 30
Igarapé-Pixuna (mouth)	3 17 13	4 23 58	65 59 36
Marauá Village (on Paraná-mirim de Bereo) ..	3 26 32	4 25 6	66 16 30
Upper mouth of Bereo Channel	3 48 46	4 25 18	66 19 30
Mouth of L. Magoary*	3 57 10	4 25 42	66 25 30
Igarapé Jaraquí (mouth)	4 27 47	4 26 12	66 33 0
Point on right, opposite Sacado de Tengué (in which is upper mouth of Tucumá Channel) }	4 40 55	4 26 47	66 41 45
Urubú-Cachoeira	5 48 45	4 31 22	67 50 30
River Chiruan (mouth)	6 3 12	4 31 21	67 50 15
Barreiras de Curuá (lower end)	6 36 30	4 36 35	69 8 45
River Tarauacá (mouth)	6 42 14	4 39 16	69 49 0
Sacado (mouth of Igarapé opposite)†	6 44 17	4 41 36	70 24 0
River Gregorio (mouth)‡	6 50 13		
River Mu (mouth)	7 10 55	4 47 24	71 51 0
Farthest point of observation	7 11 45	4 48 6	72 1 30

* The longitude was determined by the end of the eclipse of the sun, Aug. 29, 1867. From the point of observation, the lower mouth of the Tucumá Channel (more easily recognised) is about $1.25'$ s., and 0.5 sec. w.

† By Jupiter I. Ec. R., Oct. 21, the longitude is 4h. 41 min. 24 sec. w.

‡ A very indifferent observation, owing to misty cloud; the result, however, agrees well with the dead reckoning from points of observation not far above and below.

The observations were similar to those made in my journeys on the River Purús. Observations of latitude and of time (for longitude by chronometer) were taken at 56 points, including those given above, besides a few of latitude only. On my way from Teffé to the Juruá, at a point called Parauary, formerly an Indian village, and marked on many maps, I observed an occultation,* and on the river Juruá—as given above—the end of the eclipse of the sun. The longitude of the mouth of the Juruá was determined chronometrically with reference to these two points, and as the difference of that given by two chronometers is only 1·2 sec., probably that longitude is pretty nearly as correct as the absolute determinations. The same may be said of all the longitudes up to lat. 4° s. Above that, unfortunately, I could obtain no equally good absolute observations, and the longitudes are simply chronometrical; referred of course to the point of observation of the eclipse of the sun. To diminish the dependence on chronometers, and the probable error, in all possible cases time-observations were repeated on the down-voyage at points where they had been taken on the up-voyage (but except in special circumstances not at new points, as this might have distorted the river). Thus the farthest point of observation depends twenty-one days on chronometer; others proportionately less. The rate assumed was that given by time-observations at the same point, on November 6th and 13th (*i. e.*, going and returning); the interval being long enough to eliminate the effect of small errors of observation, and at the same time so short that it was scarcely likely, as the two chronometers had not varied their relative, that they should have varied their absolute, rate. With this rate † the differences of the longitudes given by the two chronometers are very small, the extreme being under 6 sec. These, which for brevity I will call *down-points*, have served as base-points for the determination of intermediate up-points. The intervals are so small that not much additional error can have been introduced.

A few eclipses of Jupiter's first satellite were observed; but two only with perfectly clear sky. One of these observations having been made at a definite point (that is, not a mere point on the river-bank, with nothing to mark it) is given above. It will have been seen that this longitude differs only 12 sec. from the chronometrical, and the error is on the right side,

* August 7th, 1867. γ Libræ Oc. D. (at the dark limb of the moon), giving the longitude of Parauary 4h. 19 min. 8·8 sec.

† Assuming during the whole journey above the point of observation of the eclipse of the sun, the mean rate given by time-observations taken; there, in going and returning (at an interval of 101 days), the resulting longitude of the "farthest point of observation" is 17·2 sec. less than that given above.

the *re*-appearance having been observed too late, and therefore giving too small a longitude. The other observed in long. $69^{\circ} 3'$ gives a longitude 3.5 sec. *greater* than the chronometrical, and therefore certainly argues some amount of error in this, which however I have adopted in the map.*

On the whole, I hope these longitudes may be tolerably good approximations. So far as my experience extends, in a steady canoe, on rivers like the Purús and Juruá, where there is little or no swell, chronometers rate as well as on shore.

Complete duplicate computations were made of the occultation and eclipse of the sun, as of similar observations on the Purús, though not mentioned.

From the impossibility of obtaining simultaneous observations elsewhere, only the following barometrical observations were taken on the Juruá.

Near River Tarauacá (flood-level).

Oct. 14, 9 A.M., Bar. (at 32°), 29.503, Air 77.9°	{	Whence the height above
Nov. 19, 9 A.M., Bar. at 28° , 29.627, Air 80.1°		Manáos is 249 ft., and above sea-level 380 ft.

Near River Mu (flood-level).

Nov. 14, 9 A.M., Bar. (at 32°), 29.466, Air 81° : from which, and the 2nd observation at the Tarauacá, River Mu is 15 ft. above River Tarauacá (mouth), and 531 ft. above the sea.

For the determination of the height of the river Tarauacá, in lack of simultaneous observations, I have availed myself of a table† of monthly means of meteorological observations taken at Manáos (at the level of the *new* church, 16.09 mètres, or 52.8 ft. above the mean level of the river Negro) by the Frontier Commission, during the years 1861-67; using the mean of the October and November means at Manáos, and correcting my observations for a slight difference in the barometers, *which have been compared*, and approximately for the diurnal variation. The height of Manáos (church) above the sea has been determined by the Frontier Commission from this series of 11,799 observations here, and 9007 at Pará (part of them simultaneous), as 39.98 mètres = 131.2 ft. There is, I think, no reason to doubt this being a thoroughly good *baro-*

* As the point of the Juruá nearest to the Purús is in longitude $68^{\circ} 13' \text{ w.}$, probably, *cæteris paribus*, the least distance given above, viz., 104 geographical miles, is a trifle too small.

† For this and much other valuable and interesting information respecting the meteorology of the Amazons, I am indebted to St. José da Costa Azevedo, Capitão de Fragata in the Brazilian Navy, and chief of the Frontier Commission (practically during its whole continuance); whom I must also thank for the courtesy and kindness with which he offered me free access to, and use of, all their records and data, as well geographical as meteorological.

metrical determination. My own observations—nearly one thousand—but including none during the last five months of the year, would give probably even a *less* height. Whether however under the circumstances,—a gradual slope of country and the prevalent wind from the sea (cf. Sir J. Herschel, 'Meteorology,' § 161, near end) a barometrical determination, even from years of observations, will give a sufficient height, is another question. Still, it is to be remembered that Obidos is much nearer to Manáos than to the sea, and the tide is sensible at Obidos. To what vertical height a tide-wave may roll up under various circumstances would perhaps be difficult to say; but in a large open river like the Amazons it could hardly be considerable. As the current of the Amazons is at certain times and places very great, it has perhaps been too readily supposed to be so generally; but opposing instances are not wanting. Mr. Bates tells me that once on the upper Amazons, after floating a whole night, he found that he had not floated down perceptibly, or at any rate materially.

It may be well to add, as affording to some extent a limit of error from want of simultaneous observations, that the absolute individual maximum and minimum of the whole series of 11,799 barometrical observations differ only 0·403 inch, and this difference includes the diurnal variation (about 0·125) which is not casual. Probably therefore in this part of the valley of the Amazons, giving an ample margin, 0·200 may be considered the extreme amount of error possible.

The interest and importance of the topic will, I hope, excuse this rather lengthy discussion.

DISTANCES.

	English Miles.	Geographical Miles.
Mouth of Jurúá to upper mouth of Mineroá Channel ..	65	56
„ „ lower mouth of Bereo Channel ..	78	68
„ „ upper mouth of Bereo Channel ..	173	150
„ „ lower mouth of Tucumá Channel ..	193	167
„ „ upper mouth of Tucumá Channel ..	290	251
„ „ Igarapé Banana-pixuna (mouth) ..	433	375
„ „ River Chiruan (mouth)	542	470
„ „ River Tarauacá (mouth)	828	717
„ „ River Gregorio (mouth)	953	826
„ „ River Mu (mouth)	1105	957
„ „ farthest point of the exploration ..	1133	982

ARAUÁ WORDS.

English.	Arauá.	English.	Arauá.
Turtle	Chirifuá.	Axe	Barí.
Male turtle (capit- tary)	Camará.	Sun	Mahí.
Tracajá	Chirí.	Moon	Massicú.
Male tracajá ..	Jujú.	Water (and river)	Pahá.
Peixe-boi (sea-cow)	Afina.	Fire	Si-hú.
Tapir	Awí.	Star	Amóá-húá.
Dog	Jumayhí (English j).	One	Warihí.
Tortoise	Coassá.	Two	Famihí.
Fish	Abaigauá.	Three	Arisafahá.
Wild Pig	Isamá.	Yes	Náida-á.
Taititú	Nubasá.	No	Hina-á.
Mutum (curassow- bird)	Fazú.	Good	Amozadí.
Mutum-assu ..	Ari-borí.	Bad	Amozarahá-dí.
Hen	Tacará.	Sick	Amozarahá-nahadí.
Eggs	Nafariná.	Plenty	Tóodí.
Banana	Fanará.	A lie	Timaudí.
Tobacco (or "pa- rica")	Agá.	Man	Maquidá.
Calabash	Wáu.	Woman	Waidauá.
India-rubber ..	Carú.	Boy	Ganahí-quidauá.
Copaiba oil ..	Awá-tinaní.	Father	Abí.
Bark-canoe ..	Awa-safiní.	Mother	Amí.
Lake	Dacú-fuá.	Hand	Usafá.
Yuca	Fou ou-maunidí.	Foot	Otamá.
House	Zamí.	Bow	Bigauahá.
		Arrow	Atú.
		Oar	Waramí.
		Knife	Zui-mazarú.
		Cutlass (terçado)	Sara-sará.

The spelling (or the pronunciation) is as in Portuguese; this having been adopted in the 'Glossaria Linguarum Brasiliensium;' excepting that *w* has been used, where wanted; and *h* is an aspirate. The Arauá language is pronounced with tolerable distinctness, except with respect to *f* and *h*, which it is very difficult in some cases to distinguish.

Mandos, January 21st, 1869.

XIV.—*Narrative of an Exploring Expedition from Fort Ver-
noye to the Western Shore of the Issik-Kul Lake, Eastern
Turkistan.** Translated from the Russian of P. SEMENOFF,
President of the Physical Section of the Imperial Russian
Geographical Society, by E. DELMAR MORGAN, F.R.G.S.

IN the latter half of September, 1856, the commander of the
Alatau district informed me of his intention of causing a new, and
this time a peaceable, reconnaissance in the Valley of the Chu.

* See map in 'Journal of Royal Geographical Society,' vol. xxxi., p. 356.—ED.